CLAIMS

1. The polymer electrolyte fuel cell comprising:

a hydrogen ion conductive polymer electrolyte membrane;

a pair of electrodes sandwiching said membrane;

a pair of conductive separators, each conductive separator having a gas flow channel, one of which supplies a fuel gas to one of said electrodes and the other supplies an oxidant gas to the other electrode; and

gaskets, each gasket being sandwiched between said conductive separator and said hydrogen ion conductive polymer electrolyte membrane to surround the periphery of said electrode and said gas flow channel;

wherein the weight of components eluted per gram of said conductive separator and/or said gasket is not more than 300 μg of total organic carbon, not more than 50 μg of ammonium ion, not more than 50 μg of chloride ion, not more than 20 μg of bromide ion, and not more than 10 μg of sulfurous acid ion, when said conductive separator and/or said gasket is immersed in water for 50 hours at a temperature of from 80 to 100℃.

2. The polymer electrolyte fuel cell in accordance with claim 1, wherein said conductive separator functions as an anode for electrolysis, said electrolysis

being carried out in water or an aqueous solution having pH of -0.3 or higher in a hydrogen atmosphere for 0.5 hours or longer while applying to said anode a potential of +0.05 to +0.2 V relative to a spontaneous potential.

3. The polymer electrolyte fuel cell in accordance with claim 1, wherein said conductive separator functions as a cathode for electrolysis, said electrolysis being carried out in water or an aqueous solution having pH of -0.3 or higher for 0.5 hours or longer while applying to said cathode a potential of -0.1 V or lower relative to a spontaneous potential.

4. The polymer electrolyte fuel cell in accordance with claim 1, wherein said conductive separator comprises a conductive material and a binder resin.

5. The polymer electrolyte fuel cell in accordance with claim 1, wherein said gasket and said conductive separator are integrated into one piece.

6. The polymer electrolyte fuel cell in accordance with claim 1, wherein said conductive separator comprises a conductive carbon material and a binder resin, and further contains a trapping agent capable of trapping at least either an anion or a cation.

7. The polymer electrolyte fuel cell in accordance with claim 1, wherein said gasket comprises a trapping agent capable of trapping at least either an anion or a cation.

8. The polymer electrolyte fuel cell in accordance with claim 6, wherein said trapping agent comprises an organic ion exchanger, an inorganic ion exchanger, an organic adsorbent or an inorganic adsorbent and has a particle size distribution in which particles having a particle diameter of 0.1 to 10 μm account for 50 % or higher on the numeric basis.

9. The polymer electrolyte fuel cell in accordance with claim 6, wherein said conductive separator contains 1 to 10 parts by weight of said trapping agent with respect to 100 parts by weight of said binder resin.

10. The polymer electrolyte fuel cell in accordance with claim 6, wherein said trapping agent forms a coating film on the surface of said conductive separator.

11. The polymer electrolyte fuel cell in accordance with claim 10, wherein said coating film has a thickness of 1 to 50 μm.

12. The polymer electrolyte fuel cell comprising:

a hydrogen ion conductive polymer electrolyte membrane;

a pair of electrodes sandwiching said membrane;

a pair of conductive separators, each conductive separator having a gas flow channel, one of which supplies a fuel gas to one of said electrodes and the other supplies an oxidant gas to the other electrode; and

gaskets, each gasket being sandwiched between said conductive separator and said hydrogen ion conductive polymer electrolyte membrane to surround the periphery of said electrode and said gas flow channel;

wherein said conductive separator or said gasket comprises a material that has been subjected to:

immersion in water for 10 hours or longer at a temperature of 80℃ or higher;

immersion in an aqueous solution having pH of -0.3 or higher for 10 hours or longer at a temperature of 80℃ or higher;

immersion in water for 10 hours or longer at a temperature of 80℃ or higher, while bubbling therein a gas containing carbon dioxide;

ultrasonic cleaning in water for an hour or longer at a temperature of 80℃ or higher;

ultrasonic cleaning in an aqueous solution having pH of -0.3 or higher for an hour or longer at a temperature of 80℃ or higher; or

exposure to a gas having a temperature of 80℃ or higher and a relative humidity of 100% for 10 hours or longer.

13. A method for manufacturing the polymer electrolyte fuel cell of claim 1, comprising the steps of:

mixing a conductive carbon material, a binder resin and a trapping agent capable of trapping at least either an anion or a cation; and

molding the obtained mixture into a conductive separator by compression molding, injection molding or transfer molding.